REMARKS

Obviousness Rejection over Vetter + McCloskey + Numrich

Claims 1, 4-11, 13-15, 18-20, 23, 24, and 27 stand rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over U.S. Patent No. 4,707,393 to Vetter ("Vetter") in view of U.S. Patent No. 6,184,335 to McCloskey et al. ("McCloskey") and U.S. Patent 6,613,264 to Numrich et al. ("Numrich"). 6/22/2007 Office Action, page 2, last full paragraph. Applicants respectfully traverse this rejection.

Vetter generally describes a plastic multilayer multiple-wall panel, manufactured by the coextrusion of a plurality of adhesively bonded layers of thermoplastically extrudable synthetic resins by means of a multicomponent extrusion die. Vetter abstract. Vetter provides no useful guidance on selecting a polycarbonate resin, other than to mention the bisphenols from which all aromatic polycarbonates are prepared and to make a statement of circular reasoning about selecting the polycarbonates that work in the invention:

> The polycarbonate resin usually is derived from an aromatic bisphenol or from a mixture of such bisphenols, and more particularly from bisphenol A. All polycarbonate resins which can be extruded into panels of high toughness and transparency are suited for use as materials for both the core layer and the UV absorption layer.

Vetter, col. 3, ll. 1-6. Note that the description of bisphenol type could apply to either an interfacial or melt process for polycarbonate production. Thus, Vetter does not teach or suggest the use of a melt polycarbonate, let alone a melt polycarbonate having a Fries content of about 10 ppm to about 2000 ppm.

McCloskey generally describes salts of aryl sulfonic acids, such as alkali metal salts of p-toluenesulfonic acid, that are useful in catalyst systems in melt polymerizations, particularly melt polymerizations to form polycarbonates. McCloskey abstract. McCloskey also describes polycarbonates prepared using the catalyst systems. *Id.* McCloskey notes that polycarbonates having a number average molecular weight of

about 25,000 to about 30,000 are preferred for sheet materials. McCloskey, col. 5, ll. 45-50. McCloskey does not mention multiwall sheet.

Numrich generally describes processing of polycarbonate-containing injection molding materials into optically isotropic films in a chill roll extrusion method. Numrich abstract. The optically isotropic films are used as covering films for protecting data carriers (CD-ROMS) from becoming scratched, or they are used as supporting materials for the information layer. *Id.* Numrich's films have a thickness less than 200 micrometers. Numrich, col. 2, lines 24-25. Numrich does not teach a method of producing a polycarbonate sheet, let alone a multiwall polycarbonate sheet.

Applicants respectfully assert that independent claims 1, 23, 24, and 27 are patentable over the cited references because one of ordinary skill in the art would not be motivated to select McCloskey's melt polycarbonate and Numrich's melt filtration method for use in Vetter's multiwall sheet process. Although the Supreme Court's recent decision in *KSR Int'l. Co. v. Teleflex Inc.* rejected rigid application of the teaching, suggestion, or motivation (TSM) test, it acknowledged the importance of identifying "a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does." *KSR Int'l. Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1741 (2007). And since KSR, the U.S.P.T.O. has reemphasized that "it remains necessary to identify the reason why a person of ordinary skill in the art would have combined the prior art elements in the manner claimed." 05/03/2007 Focarino memo. Applicants' independent claims 1, 23, 24, and 27 each include or further limit the requirements that "the composition comprises . . . a melt polycarbonate resin having a Fries content of about 10 ppm to about 2000 ppm" and that the method comprises "extruding [the] composition through a melt filter". Here, the Examiner has not provided plausible reasons why a person of ordinary skill in the thermoplastic arts would select McCloskey's melt polycarbonate with a low Fries content and Numrich's melt filtration method for use in Vetter's multiwall sheet process.

Applicants respectfully disagree with the Examiner's suggestion that "it would have been *prima facie* obvious to one having ordinary skill in the art at the time of the

claimed invention to have employed the polycarbonate disclosed by McCloskey et al. in the method disclosed by Vetter for the purpose of producing a multiwall sheet with improved color consistency as suggested by both Vetter and McCloskey et al." 06/22/2007 Office Action, page 3, last paragraph. In order to assess the validity of this suggestion, one must first consider the large volume of art related to methods of producing polycarbonates. For example, on 08/31/2007, a Micropatent search showed that there were 1,393 issued U.S. patents relating to polycarbonate synthesis methods as classified in 528/196. When one accounts for published-but-not-issued U.S. applications and published foreign application for which there is no issued U.S. patent, there are clearly thousands of references teaching different polycarbonate synthesis methods. The question, therefore, is why a skilled artisan would select McCloskey from among these thousands of references to combine with Vetter.

As noted above, Vetter provides little guidance in the selection of a suitable polycarbonate. In particular, Vetter does not mention, let alone distinguish between, the use of polycarbonates prepared by interfacial polymerization and polycarbonates prepared by melt polymerization. Vetter also does not mention Fries content. Moreover, McCloskey does not mention use of his composition in multiwall sheet. To the extent that McCloskey mentions the use of his polycarbonates in "sheet", a skilled artisan is more likely to interpret this reference as applying to solid sheet produced by solvent casting, calendaring, extruding, or chill roll processing than to an extrusion process for multiwall sheet. The Examiner has suggested that a person of ordinary skill in the art would employ McCloskey's polycarbonate in Vetter multiwall sheet method in order to produce "a multiwall sheet with improved color consistency as suggested by both Vetter and McCloskey et al.". However, contrary to the Examiner's suggestion, Vetter does not mention color consistency. Vetter's only mention of color is the statement that the polycarbonate resins used in his method "may be as clear as glass and colorless or conventionally tinted, opacified, or pigmented; however, the invention is of primary importance to materials with high light transmission". Vetter, col. 3, lines 7-10. Those skilled in the art of polycarbonate resins know that polycarbonates with high light transmission can be prepared by either an interfacial process or a melt polymerization process. Furthermore, the color consistency touted by McCloskey is associated with melt

processes generally, not McCloskey's particular process for producing polycarbonate with low Fries content. McCloskey, col. 1, ll. 31-33 and 46-49. Color consistency, therefore, is not a plausible reason for a skilled artisan to select a low Fries content polycarbonate produced by McCloskey's specific melt polymerization method from among thousands of polycarbonate synthesis methods for use in Vetter's multiwall sheet extrusion method.

Applicants also respectfully disagree with the Examiner's suggestion that "it would have been *prima facie* obvious to one having ordinary skill in the art at the time of the claimed invention . . . to have extruded the melt through a filter to reduce contamination of the polycarbonate melt as suggested by Numrich." 06/22/2007 Office Action, page 3, last paragraph. Note, first, that Numrich does not mention, let alone distinguish between, use of polycarbonates prepared by interfacial polymerization and polycarbonates prepared by melt polymerization. Whereas Vetter relates to multiwall sheet, Numrich relates to thin films. In particular, Numrich's films have a thickness less than 200 micrometers. Numrich, col. 2, 24-228. A skilled artisan would appreciate that contamination of the polycarbonate melt would be a much greater problem for film extrusion than for multiwall sheet extrusion, because a single contaminant particle in an extruded film could ruin the optical storage medium into which it is incorporated. So, although Numrich might motivate a skilled artisan to employ a melt filter in an extrusion process for polycarbonate film, such motivation would not exist for other polycarbonate extrusion processes, such as those for thicker sheet and multiwall sheet materials. Thus, the examiner has not provided a plausible reason for one of ordinary skill in the art to apply a specific feature of Numrich's film process to Vetter's multiwall sheet process.

Finally, the unobviousness of Applicants' invention is supported by their having proceeded contrary to conventional wisdom. The Federal Circuit has repeatedly recognized that proceeding contrary to the accepted wisdom in the art represents strong evidence of unobviousness. *In re* Hedges, 783 F.2d 1038, 1041 (Fed. Cir. 1986); *W. L. Gore & Assocs., Inc. v. Garlock, Inc.*, 721 F.2d 1540, 1552 (Fed. Cir. 1983). Applicants respectfully assert that the prior art teaches the utility of branched polycarbonates in multiwall sheet processes, but Applicants have unexpectedly discovered that melt

polycarbonates with low levels of branching – as indicated by low Fries content – produce multiwall sheet with improved cross-web uniformity.

Production of multiwall requires a polycarbonate with high melt strength. Present application, para. [0002]. This was traditionally accomplished by using an interfacial process polycarbonate that intentionally incorporates a branching agent. Present application, para. [0003]. Health, safety, environmental, and other consideration have recently prompted polycarbonate manufacturers to migrate from interfacial processes to melt processes for polycarbonate synthesis. Present application, para. [0003]-[0004]. However, the present inventors have found that the use of conventional melt polycarbonate in a process for multiwall sheet production causes unacceptable nonuniformities in the distribution of polycarbonate resin across the width of the multiwall sheet. Present application, para. [0004] and [0045]-[0046]; Table 3. Through their diligent research, the present inventors discovered that the problem could be eliminated by using a melt polycarbonate having a low concentration of the branching points known as Fries rearrangements. Specifically, the inventors discovered that a substantial improvement in the uniformity of distribution of polycarbonate resin across the width of the multiwall sheet could be achieved by using a melt polycarbonate with a Fries content of about 10 ppm to about 2000 ppm. Present application, para. [0045]-[0046], and Table 3. Based on the intentional use of branching agents in the interfacial polycarbonate conventionally used for multiwall sheet, this result is particularly surprising. In other words, based on the prior art use of branching agents to contribute melt strength to interfacial process polycarbonates used for multiwall sheet, a skilled artisan would have expected that a melt polycarbonate having a higher Fries content – corresponding to a greater degree of branching – would be better for multiwall sheet. Just the opposite was true. The present inventors have therefore proceeded contrary to conventional wisdom to solve a previously unrecognized problem.

To summarize, the Examiner has not provide a plausible "reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does." Absent impermissible hindsight, there was no reason for a skilled artisan to select the low Fries content melt polycarbonate of

McCloskey and the melt filtration step of Numrich for use in the multiwall sheet method of Vetter. Furthermore, whereas the prior art taught the importance of branched interfacial process polycarbonates to contribute the melt strength required for multiwall sheet extrusion, the present inventors have proceeded contrary to conventional wisdom by showing that a melt polycarbonate with a low degree of branching provides improved cross-web uniformity in a multiwall sheet process. Accordingly, a prima facie case of obviousness has not been established. Applicants therefore respectfully request the reconsideration and withdrawal of the rejection of claims 1, 4-11, 13-15, 18-20, 23, 24, and 27 under 35 U.S.C. § 103(a) over Vetter, McCloskey, and Numrich.

Obviousness Rejection over Vetter + McCloskey + Numrich + Mestanza

Claims 16 and 17 stand rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over Vetter in view of McCloskey and Numrich, and further in view of U.S. Patent No. 6,124,422 to Mestanza ("Mestanza"). 06/22/2007 Office Action, page 5, first paragraph. Applicants respectfully traverse this rejection to the extent it may be applicable to the claims as currently amended.

Vetter, McCloskey, and Numrich are discussed above.

Mestanza generally describes a method of quenching a polycarbonate-forming melt reaction of a diaryl carbonate and a dihydric phenol in the presence of a basic catalyst. Mestanza abstract. The quenching composition contains an acidic quencher, such as an alkyl tosylate, in a non-powder carrier. *Id.* According to the Examiner, "Mestanza discloses that it is known in the art of producing polycarbonate to add additives as a mixture and/or as a compacted blend." 06/22/2007 Office Action, page 5, second paragraph.

Mestanza does not remedy the above-described lack of motivation for a skilled artisan to combine the low Fries content melt polycarbonate of McCloskey and the melt filtration step of Numrich with the multiwall sheet method of Vetter. Claims 16 and 17, which depend ultimately from and further limit claim 1, are therefore patentable over Vetter in view of McCloskey and Numrich and further in view of Mestanza. Applicants

therefore respectfully request the reconsideration and withdrawal of the rejection of claims 16 and 17 under 35 U.S.C. § 103(a) over Vetter in view of McCloskey and Numrich and further in view of Mestanza.

Obviousness Rejection over Vetter + McCloskey + Numrich + Rosato

Claim 22 stands rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over Vetter in view of McCloskey and Numrich, and further in view of Rosato (Extruding Plastics-A Practical Processing Handbook). 06/22/2007 Office Action, page 5, fourth paragraph. Applicants respectfully traverse this rejection to the extent it may be applicable to the claims as currently amended.

Vetter, McCloskey, and Numrich are discussed above.

Rosato is cited as teaching a polycarbonate processing temperature of 280-310°C and adjustment of thermoplastic extrusion temperature to eliminate surging, gel formation, and melt fracture. 06/22/2007 Office Action, paragraph bridging pages 5 and 6.

Rosato does not remedy the above-described lack of motivation for a skilled artisan to combine the low Fries content melt polycarbonate of McCloskey and the melt filtration step of Numrich with the multiwall sheet method of Vetter. Claim 22, which depends directly from and further limits claim 1, is therefore patentable over Vetter in view of McCloskey and Numrich and further in view of Rosato. Applicants therefore respectfully request the reconsideration and withdrawal of the rejection of claim 22 under 35 U.S.C. § 103(a) over Vetter in view of McCloskey and Numrich and further in view of Rosato.

It is believed that the foregoing amendments and remarks fully comply with the Office Action and that the claims herein should now be allowable to Applicants. Accordingly, reconsideration and allowance is respectfully requested.

If there are any additional charges with respect to this Amendment or otherwise, please charge them to Deposit Account No. 50-3621 maintained by Assignee.

Respectfully submitted,

CANTOR COLBURN LLP
Applicants' Attorneys

By: J. Michael Buchanan
J. Michael Buchanan
Registration No. 44,571

Date: 2 August 2007
Customer No.: 43248
Telephone: (860) 286-2929